

cutting of the grain are driven into the outlying standing patches. There certainly was no protection received from their gregarious sleeping, since the groups of wasps were very conspicuous objects in the failing light.

Perhaps it would require considerable knowledge of wasp psychology, to be able to answer, first, why they congregate at all, instead of each sleeping on whatever stem of oats happens to be convenient, and second, why when thus congregating they ignore the similarly situated groups of other, even close related species, and choose only those of their own fellows. The wide range of the species implicated would seem to indicate that the habit is either a fundamental one, or else a general response to some peculiar environmental condition.

Entomological Laboratory, The University of California, August 1, 1907.

NOTES ON THE LIFE HISTORY OF THE LEAFY DIMORPH OF THE BOX-ELDER APHID, *CHAITOPHORUS NEGUN-* *DINIS THOS*.*

By J. J. DAVIS, OFFICE OF THE STATE ENTOMOLOGIST, URBANA, ILL.

My attention was first called to this curious dimorph by Mr. J. T. Monell, who found it at St. Louis, June 21, 1907, and had received it from Oestlund as early as 1889.

The life history of the dimorph I have found to be essentially like that of the dimorph of the European *C. testudinatus* Thorn., as described by Kessler.

In central Illinois the viviparous females begin to produce the dimorphs about June 1, and the latter, after crawling over the leaves for a short time, attach themselves to the veins of either surface of the leaf. There they remain in a dormant condition for two or three months. By the last of June or the first of July the parent females begin to disappear, and soon only stragglers can be found. In the latter part of August the dimorphs revive, molt several times, and become viviparous females. Subsequent generations are oviparous, and lay the eggs which are to carry the species over the winter.

The dimorphs are inconspicuous; they appear as minute flat scales lying close against the leaf, and having the same green color as the leaf.

The dimorph of *C. negundinis* is indistinguishable from that of *C. testudinatus* as described and figured by Kessler.

Here follow some of the details of the life history. Looking for this dimorphic aphid June 12, 1907, I found it common on both the upper and the lower surfaces of the leaves of box-elder at Urbana, Ill. At that time the winged and wingless normal forms were also abundant. The following figures show the abundance of the dimorph. June 15 the total number on the upper surfaces of twenty leaves was 1988, and on the lower surfaces, 2088—a total of 4076 individuals on the twenty leaves, or an average of 203+ to each leaf. July 19, on ten leaves which were only slightly infested and in a shaded situation, the total number of individuals on the upper surfaces was 214, while on the lower surfaces there were but 23—a ratio of 9 on the upper to 1 on the lower. After July 1 the normal forms began to disappear, and by July 19 they occurred only occasionally. Between that date and August 5 none of the normal forms were noticed, although careful searches were made for them. August 5, however, I found four young of the normal form and from one of these I obtained young. She began to bear young August 13, and bore in all 73 young, of which 27 were dimorphs and the remaining 46 normal forms. Owing to my absence I was unable to trace these to the sexual forms. August 20 I found the aphids becoming suddenly abundant on the box-elder leaves. These aphids had a decidedly reddish tinge, and were, I infer, dimorphs which had molted; since a dimorph that molted August 27 later developed into a reddish normal form. Both out-of-doors and in the insectary I have noticed the dimorphs in the act of molting.

It is probable that the fully developed dimorphs are the mothers of the sexual forms, although I have no positive evidence of this. I infer, also, that the mothers of the dimorphs may belong to any of the earlier generations.

The dimorph is capable of locomotion. In a chimney cage containing a small box-elder plant I placed pieces of leaves bearing dimorphs. As soon as the pieces of leaves began to dry up the dimorphs moved from them to the fresh leaves. In another instance the dimorphs, when transferred directly to fresh leaves with a brush, attached themselves readily to these.

I have found this dimorphic form in many localities in northern and southern Illinois, but most abundantly at Urbana.

* Read at the Chicago meeting, December 30th, 1907.

Coccinellid and chrysopid larvae have often been observed feeding on the dimorph.

The first paper on the American dimorph is an article by Mr. L. C. Bragg in *Entomological News* for December, 1907. His statement that it does not molt or reproduce is incorrect. In comparing the European dimorph with the American dimorph he states that the former has fourteen leaf-like appendages on the abdomen and the latter twenty-two; I find, however, that both the American and the European dimorphs have twenty-two flabella on the margin of the abdomen. Mr. Bragg mentions the maple-aphis (*Chaitophorus aceris*) as being the species that produces the European leafy dimorph. This was supposed to be the case until Kessler proved that they were borne by *Chaitophorus testudinatus* and not by *C. aceris*. He found that *C. aceris* produces dimorphs, to be sure, but dimorphs without leafy appendages.

Professor Oestlund, in a paper on this dimorph in *Entomological News* for March, 1908, summarizes the more important literature on the European dimorph. He refers to the species as occurring on "maples," but informs me by letter that he used this name for *Acer negundo*, the common box-elder. He uses the name *testudinatus* instead of *negundinis* for this species; but it appears from Kessler's paper that the adults of *testudinatus* are quite different from those of *negundinis*—so different that we can scarcely regard the two species as one.